

WHAT IS CLAIMED IS:

1. A liquid crystal display device, comprising:

a first substrate;

a second substrate; and

a liquid crystal layer provided between the first substrate and the second substrate, wherein:

a plurality of picture element regions are defined each by a first electrode provided on one side of the first substrate that is closer to the liquid crystal layer and a second electrode provided on the second substrate so as to oppose the first electrode via the liquid crystal layer therebetween;

the first electrode includes, in each of the plurality of picture element regions, a plurality of unit solid portions arranged in a first direction, whereby the liquid crystal layer takes a vertical alignment in the absence of an applied voltage between the first electrode and the second electrode, and forms a plurality of liquid crystal domains in the plurality of unit solid portions of the first electrode by inclined electric fields produced around the plurality of unit solid portions in response to a voltage applied between the first electrode and the second electrode, each of the plurality of liquid crystal domains taking a radially-inclined orientation;

the plurality of picture element regions are arranged in a matrix pattern including a plurality of rows extending in the second direction different from the first direction and a plurality of columns extending in the first direction; and

a polarity of a voltage applied across the liquid crystal layer in a first picture element region among the plurality of picture element regions is different from a polarity of a voltage applied across the liquid crystal layer in a second picture element region among the plurality of picture element regions that belongs to the same row as that of the first picture element region and belongs to a column adjacent to a column to which the first picture element region belongs in each frame.

2. The liquid crystal display device according to claim 1, wherein the plurality of picture element regions each have a shape whose longitudinal direction is defined in the first direction and whose width direction is defined in the second direction.

3. The liquid crystal display device according to claim 1, wherein a polarity of a voltage applied across the liquid crystal layer in a plurality of picture element regions belonging to one column among the plurality of picture element regions is

reversed for every n rows (where n is an integer of 1 or more) in each frame.

4. The liquid crystal display device according to claim 1, wherein a polarity of a voltage applied across the liquid crystal layer in the first picture element region is different from a polarity of a voltage applied across the liquid crystal layer in a third picture element region that belongs to the same column as that of the first picture element region and belongs to a row adjacent to a row to which the first picture element region belongs in each frame.

5. The liquid crystal display device according to claim 1, wherein a shape of each of the plurality of unit solid portions has rotational symmetry.

6. The liquid crystal display device according to claim 5, wherein each of the plurality of unit solid portions has a generally circular shape.

7. The liquid crystal display device according to claim 5, wherein each of the plurality of unit solid portions has a generally rectangular shape with generally arc-shaped corner portions.

8. The liquid crystal display device according to claim 5, wherein each of the plurality of unit solid portions has a shape with acute angle corners.

9. The liquid crystal display device according to claim 1, wherein the second substrate includes, in a region corresponding to at least one of the plurality of liquid crystal domains, an orientation-regulating structure that exerts an orientation-regulating force for orienting liquid crystal molecules in the at least one liquid crystal domain into a radially-inclined orientation at least in the presence of an applied voltage.

10. The liquid crystal display device according to claim 9, wherein the orientation-regulating structure is provided in a region in the vicinity of a center of the at least one liquid crystal domain.

11. The liquid crystal display device according to claim 9, wherein the orientation-regulating structure exerts an orientation-regulating force for orienting the liquid crystal molecules into a radially-inclined orientation even in the absence of an applied voltage.

12. The liquid crystal display device according to claim 11, wherein the orientation-regulating structure is a first

protrusion protruding from the second substrate into the liquid crystal layer.

13. The liquid crystal display device according to claim 12, wherein a thickness of the liquid crystal layer is defined by the first protrusion protruding from the second substrate into the liquid crystal layer.

14. The liquid crystal display device according to claim 1, wherein:

the first substrate includes a plurality of open regions that do not overlap with the first electrode; and

when a voltage is applied between the first electrode and the second electrode, the liquid crystal layer forms a plurality of additional liquid crystal domains in the plurality of open regions by the inclined electric fields, each of the additional liquid crystal domains taking a radially-inclined orientation.

15. The liquid crystal display device according to claim 14, wherein at least some of the plurality of open regions have substantially the same shape and substantially the same size, and form a plurality of unit lattices that are arranged so as to have rotational symmetry.

16. The liquid crystal display device according to claim 15, wherein a shape of each of the at least some of the plurality of open regions has rotational symmetry.

17. The liquid crystal display device according to claim 15, wherein each of the at least some of the plurality of open regions has a generally circular shape.

18. The liquid crystal display device according to claim 14, further comprising a second protrusion within each of the plurality of open regions of the first substrate, wherein a side surface of the protrusion exerts, for liquid crystal molecules of the liquid crystal layer, an orientation-regulating force of the same direction as a direction of orientation regulation by the inclined electric field.

19. The liquid crystal display device according to claim 1, wherein:

the first substrate further comprises a plurality of switching elements provided respectively for the plurality of picture element regions; and

the first electrode comprises a plurality of picture element electrodes provided respectively for the plurality of picture element regions and switched respectively by the switching elements, and the second electrode is at

least one counter electrode opposing the plurality of picture element electrodes.